WHAT IS CLAIMED IS:

1. A soldering iron tip, comprising:

a heat-conducting copper or copper alloy core; and

a metal particle sintered member connected to the core to transfer heat therefrom to thereby form a working end of the soldering iron tip.

2. The soldering iron tip of claim 1 wherein the metal particle sintered member includes a sintering base material or a sintering base material and a sintering additive.

3. The soldering iron tip of claim 2 wherein the sintering base material includes at least one of iron particles, nickel particles, and cobalt particles.

4. The soldering iron tip of claim 3 wherein the iron particles used for the sintering base material are iron particles have a purity of no less than 99.5%.

5. The soldering iron tip of claim 2 wherein the content of the sintering base material in the metal particle sintered member is between 60% and 99.99%.

6. The soldering iron tip of claim 1 wherein the metal particle sintered member is a cap having a wall thickness of 200 to 800 microns.

7. The soldering iron tip of claim 1 wherein the metal particle sintered body comprises a sintering base material and a sintering additive, and wherein the sintering additive is at least one of silicon particles, copper particles, silver particles, tin particles, boron particles, ceramic particles, and carbon particles.

8. The soldering iron tip of claim 7 wherein the content of the sintering additive in the metal particle sintered member is between 0.01% and 40%.

9. The soldering iron tip of claim 1 wherein the soldering tip is adapted to be provided on a main body having a heating element.

10. The soldering iron tip of claim 1 wherein the soldering iron tip is adapted to be provided as a replaceable suction nozzle on a main body having a heating element.

11. The soldering iron tip of claim 1 wherein the core includes a tapered portion and the metal particle sintered member is a cap on an end of the tapered portion.

12. The soldering iron tip of claim 11 further comprising silver particle/powder paste between the cap and the tapered portion.

13. The soldering iron tip of claim 11 wherein the cap is formed on the tapered portion.

14. The soldering iron tip of claim 13 wherein the core includes a base portion and the tapered portion extends out from the base portion.

15. The soldering iron tip of claim 11 wherein the metal particle sintered member is only on a forward tip of the tapered portion.

16. The soldering iron tip of claim 11 wherein the tapered portion includes a tip and a connecting portion connecting the tip end to a base portion of the core, and the metal particle sintered member is on the tip end but not the connecting portion.

17. The soldering iron tip of claim 1 wherein the core includes a cylindrical member formed separately from the metal particle sintered member and to which the metal particle sintered member is secured.

18. The soldering iron tip of claim 1 wherein the core includes a cylindrical body member and a conical forward end, and the metal particle sintered member comprises a cap fitting on and covering at least substantially the entire forward end.

19. The soldering iron tip of claim 18 wherein the cap is brazed to the forward end.

20. The soldering iron tip of claim 1 wherein the metal particles used in the sintered member and any sintering member additive particles have a particle size of no greater than 50 or 200 μm.

21. The soldering iron tip of claim 1 wherein the metal particle sintered member includes a first layer and a second layer and wherein the first layer defines the outer surface of the distal tip of the member.

22. The soldering iron tip of claim 21 wherein the first layer includes a sintering base material and a sintering additive.

23. The soldering iron tip of claim 21 wherein the second layer is sintered from copper particles or copper chromium particles.

24. The soldering iron tip of claim 21 wherein the second layer defines a body member having a conical end and the first layer defines a cap on the conical end.

25. The soldering iron tip of claim 21 wherein the second layer defines a rear body member and the first layer defines a forward conical tip member which interlocks with the rear body member.

26. The soldering iron tip of claim 25 wherein the rear body member includes a forward nub on which the tip member interlocks.

27. The soldering iron tip of claim 1 wherein the core comprises a pipe and the metal particle sintered member comprises a forward end member which is brazed to the pipe.

28. The soldering iron tip of claim 27 wherein the forward end member includes a rearward nub which is secured into a forward end of the pipe.

29. The soldering iron tip of claim 1 wherein the core includes an end socket and the metal particle sintered member is an elongated member having its proximal end affixed in and to the socket.

30. The soldering iron tip of claim 1 wherein the core has an end nub and the metal particle sintered member is joined to the nub and extends out therefrom.

31. The soldering iron tip of claim 1 wherein the core includes a proximal end threaded cavity for threading the soldering iron tip in position.

32. The soldering iron tip of claim 1 wherein the core includes at its rearward end a female threaded portion.

33. The soldering iron tip of claim 1 wherein the core includes a forward end having a through-passageway, and the metal particle sintered member is on the forward end and has a through-opening communicating with the passageway.

34. The soldering iron tip of claim 33 wherein the metal particle sintered member includes a sleeve extending into the passageway.

35. The soldering iron tip of claim 1 wherein the metal particle sintered member is an iron cap, the core includes a forward extension member, and the cap is brazed to a

forward tip end of the extension member with a silver paste sandwiched between the cap and the extension member.

36. The soldering iron tip of claim 1 wherein the core includes a base portion and a forward extension portion, the metal particle sintered member is at an end of the forward extension portion, and further comprising a top coating on the forward extension portion but not on a working tip end of the metal particle sintered member.

37. The soldering iron tip of claim 36 wherein the top coating is not wettable by solder, and wherein the tin alloy coating on the working end has a good wettability by solder.

38. The soldering iron tip of claim 36 wherein the top coating is a ceramic material, a cermet material or a metal.

39. The soldering iron tip of claim 36 further comprising an undercoating between the top coating and the forward extension portion, the undercoating having a heat expansion rate which is greater than that of the top coating and less than that of the material of the core.

40. The soldering iron tip of claim 36 further comprising a sealing coating on the top coating.

41. The soldering iron tip of claim 36 wherein the top coating extends forward a short distance onto a rearward portion of the metal particle sintered member.

42. The soldering iron tip of claim 1 wherein the core has a base portion which has a rearwardly-extending cavity.

43. The soldering iron tip of claim 42 further comprising an Ag-Al-Cu alloy coating layer in the cavity.

44. The soldering iron tip of claim 42 further comprising an aluminum oxide film in the cavity.

45. A method of manufacturing a soldering iron tip, comprising:

forming a metal particle green compact;

sintering the green compact to form a sintered member; and

joining the sintered member to a forward end of a copper or copper alloy core so that the sintered member forms a working end of the soldering iron tip.

46. The method of claim 45 wherein there is no secondary processing of the sintered member after the sintering.

47. The method of claim 45 wherein the sintered member forms a cap having a thickness of 200 to 800 microns.

48. The method of claim 45 wherein the forming includes forming the green compact from a sintering base material including at least one of iron particles, nickel particles and cobalt particles.

49. The method of claim 48 wherein the forming the green compact includes the iron particles having a purity no less than 99.5%.

50. The method of claim 48 wherein the content of the sintering base material is between 60% and 99.99%.

51. The method of claim 45 wherein the forming includes forming the metal particle green compact from a sintering base material and a sintering additive.

52. The method of claim 51 wherein the sintering additive includes at least one of silicon particles, copper particles, silver particles, tin particles, boron particles, and carbon particles.

53. The method of claim 51 wherein the content of the sintering additive in the metal particle green compact is between 0.1% and 40%.

54. The method of claim 45 wherein the forming the green compact includes mixing a sintering base material with a binder.

55. The method of claim 54 wherein the binder is the bonds diluted with solvents in an amount of approximately 40% by volume of the mixture.

56. The method of claim 45 wherein the sintering includes heating the green compact in a non-oxidative (inert) atmosphere at 800 to 1,300°C.

57. The method of claim 45 wherein the joining includes brazing the sintered member to the forward end.

58. The method of claim 45 after the sintering, further shaping the sintered member by preform forging or powder forging at a temperature of 300 to 500°C.

59. The method of claim 45 wherein the forming is by pressure molding.

60. The method of claim 45 wherein the forming is by cold isostatic press compression molding, hot isostatic press compression molding, or mechanical alloying to form a molded part.

61. The method of claim 60 wherein the molded part is plastically worked into a rod shape or a filament shape to form a worked part.

62. The method of claim 61 further comprising further machining the worked part.

63. The method of claim 61 wherein the worked part is not further machined or processed.

64. The method of claim 45 wherein the sintering base material and the sintering additive of the green compact are alloyed by means of a solution process and further granulated to produce an alloy particle.

65. The method of claim 64 wherein the particle size of the sintering base material, the sintering additive or the alloy product used is no greater than 200 μm.

66. The method of claim 64 wherein the particle size of the sintering base material, the sintering additive or the alloy particle used is no greater than 50 μm.

67. The method of claim 64 wherein ultra fine particles are used as the sintering base material, the sintering additive or the alloy particle.

68. The method of claim 45 wherein the sintering and the joining are conducted at the same time.

69. The method of claim 45 wherein the forming includes pressure molding a sintering base material, a sintering additive and a binder.

70. The method of claim 45 further comprising after the sintering, machining the sintered member to a desired shape.

71. The method of claim 70 wherein the machining is before the joining.

72. The method of claim 45 wherein the joining includes brazing at 650 to 850°C. using a silver brazing alloy.

73. The method of claim 45 wherein the joining is by pressure welding, friction welding or ultrasonic welding.

74. The method of claim 45 wherein the forming uses powder metallurgy.

75. The method of claim 45 wherein the joining includes affixing the green compact to the forward end and the sintering is after the affixing.

76. The method of claim 45 wherein the sintering is in an oxidative atmosphere at a temperature which is less than 800 °C. and which is no greater than the melting point of the core.

77. The method of claim 45 further comprising after the joining and the sintering, finishing the sintered member.

78. The method of claim 45 wherein the forming is by pressureless molding.

79. The method of claim 45 wherein the sintering is by liquid phase sintering.

80. The method of claim 45 wherein the forming uses a sintering base material and a sintering additive having a relatively low melting point, and the sintering is performed at temperatures higher than the relatively low melting point.

81. The method of claim 45 wherein the sintered member is a plastically formed rod, and further machining the rod.

82. The method of claim 45 wherein the sintering includes sintering first and second layers of different materials.

83. The method of claim 82 wherein the first layer covers a distal tip end and is produced from a mixture of sintering base materials and sintering additives and the second layer is produced from copper particles or copper-chromium particles.

84. The method of claim 82 wherein the two-layer sintered layer is further formed so as to define the desired shape.

85. The method of claim 45 wherein the joining includes brazing.

86. The method of claim 45 wherein the core comprises a copper or copper alloy pipe.

87. The method of claim 45 wherein the core includes a suction through-passageway engaging the forward end, and the sintered member includes an opening and wherein the joining joins the sintered member so that the opening communicates with the through-passageway, whereby the soldering iron tip defines a soldering iron tip for a suction desoldering tool.

88. The method of claim 45 wherein the core includes a threaded member at a rear surface thereof allowing for replacement of the soldering iron tip.

89. The method of claim 45 wherein the joining includes inserting the sintered member into an opening in the forward end.

90. The method of claim 45 wherein the core includes a suction passageway engaging the forward end, and the joining includes joining the sintered member so that a cylindrical portion extends into the opening and a lip portion extends over the forward end.

91. The method of claim 45 further comprising the core including a base portion and a forward extension portion, and the joining joins the sintered member to a forward end of the forward extension portion.

92. The method of claim 45 wherein the sintered member defines a cap, and the forming includes applying an Ag-particle paste to at least one of an inside surface of the cap and the forward end, and after the applying inserting the cap on the forward end and brazing the inserted cap to the forward end.

93. The method of claim 92 wherein before the inserting and the brazing, mounting a brazing filler metal ring to the forward end.

94. The method of claim 45 further comprising masking a working tip end of the joined sintered member, and with the working tip end masked, spraying a top coating on the unmasked forward extension position.

95. The method of claim 94 wherein the top coating is a ceramic, cermet or metal material.

96. The method of claim 45 wherein the core has a base portion having a rearwardly-opening cavity.

97. The method of claim 96 further comprising applying a paste which includes Al and Ag particles in the cavity, and after the applying, heating the paste to form an Ag-Al-Cu alloy coating layer in the cavity.

98. The method of claim 96 further comprising forming an aluminum oxide film in the cavity.